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(54) **SEAT ASSEMBLY HAVING AN IMPACT LOAD TRANSFER STRUCTURE**

SITZBAUGRUPPE MIT STRUKTUR ZUR ÜBERTRAGUNG VON STOSSBELASTUNGEN

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Description

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of and priority to U.S. Provisional Application No. 61/231,226, filed August 4, 2009.

BACKGROUND

[0002] The present disclosure relates generally to the field of seating for vehicles and more particularly, to side a impact load transfer structure for a vehicle seat.

DESCRIPTION OF THE RELATED ART

[0003] It is generally known to provide a vehicle seat having various safety features. Further, it is generally known to provide a vehicle seat mechanism for managing impact forces. For example, it is known to provide a seat belt for securing an occupant within a seat and an air bag that deploys upon vehicle impact to minimize or prevent injury to an occupant during a vehicle collision or accident. Known safety features, however, can include a number of disadvantages, such as, being costly, complex, and relatively massive, among other disadvantages. Known safety features also remain deficient because under certain circumstances they do not provide complete safety for occupants. Moreover, known safety features do not effectively transfer an impact force or load from a vehicle collision to better protect a vehicle occupant. JP 2004 231060 A and JP H11 222088 A disclose seat back frames for use in a vehicle seat assembly.

[0004] Accordingly, there remains a continuing need to provide an improved seat that provides greater safety for an occupant during a vehicle side impact collision, provides improved management of a load force from an impact collision, provides higher performance and at the same time has lower cost, lower mass, lower complexity, is relatively easy to manufacture, and has exceptional load carrying capabilities and occupant zone protection.

[0005] The seat back frame according to the invention comprises the features of claim 1.

SUMMARY

[0006] Accordingly, the present invention relates to a seat back frame for use in a vehicle seat assembly including a first side member, a second side member, an upper cross member, and a lower cross member. The seat back frame also includes a load transfer member that transfers impact loads from a collision diagonally through the seat assembly.

[0007] An advantage of the present invention is that the seat assembly more effectively transfers an impact load from a vehicle collision through the seat and away from the occupant. Another advantage of the present invention is enhanced occupant safety. A further advantage of the present invention is that the seat assembly

provides higher safety performance while reducing seat assembly costs.

[0008] Other features and advantages of the present invention will be readily appreciated, as the same becomes better understood after reading the subsequent description taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009]

FIG. 1 is a perspective view of a vehicle, according to an exemplary embodiment.

FIG. 2 is a perspective view of a seat assembly, according to an exemplary embodiment.

FIG. 3 is a diagram of a side impact collision between two vehicles, according to an exemplary embodiment.

FIG. 4 is a partial front view of a vehicle interior having a vehicle seat assembly showing the impact forces from a side impact collision, according to an exemplary embodiment.

FIG. 5 is a front view of a seat back frame having a load transfer structure, according to the invention.

FIG. 6 is a front perspective view of a seat back frame having a load transfer structure, according to another embodiment.

FIG. 7 is a front perspective view of a seat back frame having a load transfer structure, according to still another embodiment.

FIG. 8 is a front perspective view of a seat back frame having a load transfer structure, according to still another embodiment.

FIG. 9A is a front view of a seat back frame having a load transfer structure, according to an embodiment not according to the invention.

FIG. 9B is a cross-sectional view of the seat back frame having a load transfer structure of FIG. 9A along the A-A line.

FIG. 9C is a cross-sectional view of the seat back frame having a load transfer structure of FIG. 9A along the B-B line.

FIG. 9D is a cross-sectional view of the seat back frame having a load transfer structure of FIG. 9A along the D-D line.

FIG. 9E is a cross-sectional view of the seat back frame having a load transfer structure of FIG. 9A along the C-C line.

FIG. 9F is a cross-sectional view of the seat back frame having a load transfer structure of FIG. 9A along the E-E and F-F line.

FIG. 10A is a front view of a seat back frame having a load transfer structure, according to an embodiment not according to the invention.

FIG. 10B is a cross-sectional view of the seat back frame of FIG. 10A along the A-A line.

FIG. 11 is a front view of a seat back frame having a load transfer structure, according to still another embodiment not according to the invention.

FIG. 12 is a front view of a seat back frame having a load transfer structure, according to still another embodiment not according to the invention.

DESCRIPTION

[0010] The seat back frame according to the invention comprises the features of claim 1.

[0011] Referring generally to the FIGURES and particularly to FIG. 1, a vehicle 10 is shown according to an exemplary embodiment. The vehicle 10 can include one or more seat assemblies 12 provided for occupant(s) of the vehicle 10. While the vehicle 10 shown is a four door sedan, it should be understood that the seat assembly 12 may be used in a mini-van, sport utility vehicle, airplane, boat, or any other type of vehicle.

[0012] Referring now to FIG. 2, a seat assembly 12 is shown. The seat assembly 12 can include a seat back 18 to provide comfort, support and protection to the seated occupant. A seat cushion (base) 20 is operatively connected to the seat back, and likewise provides comfort, support and protection to the seated occupant. A head restraint 22 is positioned at an upper end of the seat back 18. The seat assembly 12 includes a recliner mechanism 24 operatively connected to the seat back and seat cushion, to provide rotatable adjustability of the seat back 18 with respect to the seat cushion 20. The seat assembly is secured to the vehicle using a track assembly 26. The track assembly of this example provides for adjustability or movement of the relative position of the seat assembly 12 for comfort or utility of the seated occupant. The seat back 18 can include, for example, a foam pad 28, a trim cover 30, and a one-piece seat back structure 32. The seat cushion 20 can include, for example, a foam pad 34, a trim cover 36, and a one-piece seat cushion structure 38. The seat assembly 12 illustrated is a one-occupant seat typically used in the front row of a vehicle, but a one-piece structure 5 may be incorporated into any seat assembly, such as, a second row bench, a third row fold flat seat, or the like, which may utilize any type of seat functionality for use within any vehicle.

[0013] Referring now to FIGS. 3 and 4, a diagram of a side impact collision between the vehicle and an object such as another vehicle, or the like, and a vehicle seat frame assembly 12 within a vehicle interior depicting an impact forces from a side impact collision are shown, respectively. More specifically, FIG. 3 shows the point of impact of a moving vehicle impacting the side of a stationary vehicle. The number, magnitude, direction of impact loads/forces may vary depending on a variety of variables/factors, such as, the impact velocity between the vehicle and another object(s), the location of the impact on the vehicle, the direction of impact, or the like. For example, a collision can result in one or several load paths having different directions and magnitude. In this

example, the side impact creates a first load path (L1) generally directed diagonally downward through the vehicle door (D) and body (B) towards the center of the vehicle and the center console (C) and a second load path (L2) generally directed horizontally through the vehicle door (D) and body (B) towards the center of the vehicle and the center console (C), as shown in FIG. 4. These impact forces or loads can cause significant damage to the vehicle 10 and severe injury to occupants if left unchecked or unmitigated. The load transfer structure or member 74 of the present disclosure aids in transferring one or more loads or impact forces from a vehicle impact collision to better protect a vehicle occupant. More specifically, the load transfer structure 74 strengthens the seat frame 24 in the direction of the load path to transfer the crash load through the seat assembly and into the center console (C) and/or the center vehicle body (B).

[0014] Referring now to FIGS. 5 and 6, a seat back frame 24 having a load transfer structure or member 74 of the present invention is shown. The seat back frame 24 includes a first side member 26, a second side member 28, a lower cross member 30, an upper cross member 32, and a middle cross member 33. The first side member 26 includes a first end (upper end) 34 and a second end (lower end) 36, and the second side member 28 includes a first end (upper end) 38 and a second end (lower end) 40. The first and second side members 26, 28 are positioned generally parallel to one another and are spaced apart at a predetermined distance. The lower cross member 30 includes a first and second end 42, 44 and is positioned generally perpendicularly between the first and second side member 26, 28, such that the first end of the lower cross member 42 is coupled to the second end of the first side member 36 and the second end of the lower cross member 44 is coupled to the second end of the second side member 40. The upper cross member 46 is positioned generally perpendicularly between the first and second side members 26, 28, such that the first end of the upper cross member 46 is coupled to the first end of the first side member 34 and the second end of the upper cross member 48 is coupled to the first end of the second side member 40. The middle cross member 33 includes a first end 50 and second end 52 and generally extends diagonally between the middle portion of the second side member 28 and the middle portion of the lower cross member 30, such that the second end of the middle cross member 52 is coupled to the middle portion of the second side member 28 and the first end of the middle cross member 50 is coupled to the middle portion of the lower cross member 30. The seat back frame 24 can also include a first and second bracket member 54, 56 coupled to the upper cross member 32 to couple other seat structures thereto, such as, a head restraint 18. The diagonally positioned middle cross member 33 acts as a load transfer structure or member 74 that effectively transfers an impact load from a diagonal load path through or around the seat assembly 12. In this example, the middle cross member 33 is integral with the upper cross member 32

and forms a single unitary body. The position and direction of the middle cross member 33 can vary depending upon various requirements, needs, and criteria. Generally, the middle cross member 33 extends away from the outboard side of the seat frame 24 (adjacent the door side of the vehicle) to the inboard side of the seat frame 24 towards the center of the vehicle. Therefore, the middle cross member 33 extends from the second side member 28 downward towards the lower cross member 30 for a driver side seat assembly 12, as shown in FIG. 5. For a passenger side assembly 12, the middle cross member 33 extends from the first side member 26 downward towards the lower cross member 30.

[0015] The members can also include side walls extending from their surfaces, channels/grooves for attachment and overlapping other members, apertures, attachment surfaces, flanges, extensions, or the like. In this example, the first and second side members 26, 28 include a first (outer) side wall 58 generally extending perpendicularly from the first (front) surface 60 at an outer edge 62 and a second (inner) side wall 64 generally extending perpendicularly from the first (front) surface 60 at an inner edge 66 to form a generally U-shaped channel 68.

[0016] It should be noted that the members of the seat back frame 24 can have various geometries, sizes, shapes, or the like. For example, the members can be stamped generally planar members, tubular members, or the like, and have predetermined cross-sectional profiles, such as, rectangular, circular, oval, irregular, U-shaped, or the like. In this example, the upper cross member 32 and the middle cross member 33 have a tubular cross-sectional profile. Moreover, the surfaces of the members may have additional features that strengthen the members and facilitate load transferring, such as, corrugations/convolutions, dimples, ribs, apertures, or the like.

[0017] It should also be noted that the middle cross member 33 can also be positioned in other configurations, such as, for example, the opposite direction such that the middle cross member 33 is coupled to and extends downward from the first side member 26, or the like. It is also noted that a second middle cross member 33 could be included such that there is a diagonal middle cross member 33 extending diagonally from each side member 26, 28 in opposite directions.

[0018] The components of the seat back frame 24 can be made from a variety of materials, such as, metal, alloys, high strength steel (HSS), or the like, and can be processed using a variety of processes, such as, heat treatment, or the like. The components of the seat back frame 24 can also be coupled together using a variety of techniques, such as, welding, laser welding, fastening, bolting, or the like. The seat back frame 24 can also be coupled to other load transfer structures, devices, or mechanisms 74, as described throughout the present invention.

[0019] Referring now to FIG. 7, another embodiment

of a seat back frame having a load transfer structure (74) is shown. In this embodiment, the seat back frame 124 is similar to the seat back frame of FIG. 5, wherein like features are represented by like reference numbers. The seat back frame 124 includes a middle cross member 133 that is not integral with the upper cross member 132. The middle cross member 133 has a tubular and rectangular cross-sectional profile. This enables the incorporation of a middle cross member 133 having a different cross-sectional profile than the upper cross member 132. In this example, the middle cross member 133 has a rectangular cross-sectional profile and acts as the load transfer structure (74).

[0020] Referring now to FIG. 8, still another embodiment of a seat back frame 224 having a load transfer structure (74) is shown. In this embodiment, the seat back frame 224 is similar to the seat back frame of FIG. 5, wherein like features are represented by like reference numbers. The seat back frame 224 includes a middle cross member 233 that is not integral with the upper cross member 232. The middle cross member 233 is generally an elongated planar member. This enables the incorporation of a middle cross member 233 having a different cross-sectional profile than the upper cross member 232. In this example, the middle cross member 233 has a flat cross-sectional profile and acts as the load transfer structure (74). The middle cross member 233 may be coupled to the inside of the side member 228 (e.g., front surface, etc.) and lower cross member 233, the outside of the side member 228 (e.g., rear surface, etc.) and lower cross member 233, or a combination thereof.

[0021] Referring now to FIGS. 9A-9F, an embodiment not forming part of the invention of a seat back frame 324 having a load transfer structure 74 is shown. The seat back frame 324 includes a first side member 326, a second side member 328, a lower cross member 330, an upper cross member 332, and a middle cross member 333, as shown in FIG. 9A. These members are generally hollow tubes having a predetermined cross-sectional profile, such as, rectangular, circular, U-shaped, or the like. The first side member 326 includes a first end (upper end) 334 and a second end (lower end) 336, and the second side member 328 includes a first end (upper end) 338 and a second end (lower end) 340. The first and second side members 326, 328 are positioned generally parallel to one another and are spaced apart at a predetermined distance. The first and second side members 326, 328 have a generally rectangular cross-section in which their first ends 334, 338 have a cross-section that is generally U-shaped for attachment to the upper cross member 332, as shown in FIGS. 9B, 9C, 9F. The lower cross member 330 includes a first and second end 342, 344 and is positioned generally perpendicularly between the first and second side member 326, 328, such that the first end of the lower cross member 342 is coupled to the second end of the first side member 336 and the second end of the lower cross member 344 is coupled to the second end of the second side member 340. The lower

cross member 330 has a generally circular cross-section, as shown in FIG. 9E. The upper cross member 332 includes a first end 346 and a second end 348 and a generally rectangular cross-section, as shown in FIG. 9D. The upper cross member 346 is positioned generally perpendicularly between the first and second side members 326, 328, such that the first end of the upper cross member 346 is coupled to the first end of the first side member 334 and the second end of the upper cross member 348 is coupled to the first end of the second side member 340. The middle cross member 333 includes a first end 350 and second end 352 and is positioned perpendicularly between the middle portion of the first and second side member 326, 328, wherein the first end of the middle cross member 350 is coupled to the middle portion of the first side member 326 and the second end of the middle cross member 352 is coupled to the middle portion of the second side member 328. The middle cross member 333 has a generally rectangular cross-section. The seat back frame 324 can also include a first and second bracket member 354, 356 coupled to the upper cross member 332 to couple other seat structures thereto, such as, a head restraint 318. The first and second side members 326, 328 can also include a first and second reinforcement member 358, 360 coupled thereto. The first and second reinforcement member 358, 360 each have a first end (upper end) 362, 366 and a second end (lower end) 364, 368. The first end of the first and second reinforcement members 362, 366 also includes an extension 370, 372 for supporting at least a portion of the middle cross member 333.

[0022] The components of the seat back frame 324 can be made from a variety of materials, such as, metal, alloys, high strength steel (HSS), or the like, and can be processed using a variety of processes, such as, heat treatment, or the like. The components of the seat back frame 324 can also be coupled together using a variety of techniques, such as, welding, laser welding, fastening, bolting, or the like. In this example, the lower cross member (side load tube) 330, the upper cross member 332, and the middle cross tube 33 act as load transfer structures 374 that effectively transfer the loads from a vehicle collision impact. The seat back frame 324 can also be coupled to other load transfer structures, devices, or mechanisms, as described throughout the present disclosure.

[0023] Referring now to FIGS. 10A-10B, an embodiment of a seat back frame 424 having a load transfer structure or member 474 is shown. In this embodiment not according to the invention the load transfer structure 474 is a reinforcement member having predetermined characteristics, such as, shape, size, material type, thickness, or the like. In this example, the load transfer structure 474 is generally an elongated member having a rectangular tubular cross-section (as shown in FIG. 10B) having a first and second end 476, 478. The load transfer structure 474 is coupled to the seat back frame 424 such that the first end 476 is adjacent the first side member

426 and the second end 478 is adjacent the second side member 428. More specifically, the load transfer structure 474 is generally positioned in the middle portion of the seat back 424 between the first and second side members 426, 428 of the seat back frame 424 to selectively reinforce the seat back frame 424 and effectively transfer the load from a vehicle side impact collision. Alternatively in another embodiment not according to the invention, the load transfer structure 474 can be positioned diagonally between the first and second side members 426, 428 of the seat back frame 424, as shown in FIG. 11. According to yet another embodiment not according to the invention a plurality of load transfer structures 474 can be positioned diagonally between the first and second side members 426, 428 of the seat back frame 424, as shown in FIG. 12.

[0024] It is important to note that the construction and arrangement of the load transfer structure, device and mechanism as shown in the various exemplary embodiments is illustrative only. Although only a few embodiments have been described in detail in this disclosure, those skilled in the art who review this disclosure will readily appreciate that many modifications are possible (e.g., variations in sizes, dimensions, structures, shapes and proportions of the various elements, values of parameters, mounting arrangements, use of materials, colors, orientations, etc.) without materially departing from the scope of the attached claims. For example, elements shown as integrally formed may be constructed of multiple parts or elements, the position of elements may be reversed or otherwise varied, and the nature or number of discrete elements or positions may be altered or varied.

[0025] Many modifications and variations of the present disclosure are possible in light of the above teachings. Therefore, within the scope of the appended claim, the present invention may be practiced other than as specifically described.

Claims

1. A seat back frame (24, 124, 224, 324, 424) for use in a vehicle seat assembly (12), the seat back frame (24, 124, 224, 324, 424) comprising:
 - a first side member (26, 126, 226, 326, 426) having a first end (34), a second end (36), an inner surface, and an outer surface, and
 - a second side member (28, 128, 228, 328, 428) having a first end (38), a second end (40), an inner surface, and an outer surface, the first side member (26, 126, 226, 326, 426) and the second side member (28, 128, 228, 328, 428) spaced apart from one another;
 - an upper cross member (32, 132, 232, 332, 432) having a first end (46) and a second end (48), the first end (46) coupled to the first end

(34) of the first side member (26, 126, 226, 326, 426) and the second end (48) coupled to the first end (38) of the second side member (28, 128, 228, 328, 428);

- a lower cross member (30, 130, 230, 330, 430) having a first end (42) and a second end (44), the first end (42, 342) coupled to the second end (36) of the first side member (26, 126, 226, 326, 426) and the second end (44) coupled to the second end (40) of the second side member (28, 128, 228, 328, 428); and
- a middle cross member (33, 133, 233) is diagonally positioned and acts as a load transfer member (74),

wherein the load transfer member (74) having a first end and a second end, the first end coupled to one of a middle portion of the first side member (26, 126, 226, 426) and a middle portion of the second side member (28, 128, 228, 428) and the second end is coupled to a middle portion of the lower cross member (30, 130, 230, 430) such that the load transfer member extends diagonally downwards toward the lower cross member (30, 130, 230, 330, 430), wherein the load transfer member (74) is a load transfer structure that transfers a load from an impact through the seat assembly (12).

2. The seat back frame (24, 124, 224, 324, 424) of Claim 1, further comprising an additional load transfer member (333) having a first end and a second end, wherein the first end is coupled to the middle portion of the first side member (26, 126, 226, 326, 426) and the second end of the additional load transfer member (333) is coupled to the middle portion of the second side member (28, 128, 228, 328, 428), and the load transfer member (333) is a load transfer structure that transfers the load from a side impact through the seat assembly (12).
3. The seat back frame (24, 124, 224, 324, 424) of Claim 2, further comprising a first reinforcement member (58, 358) having a first end and a second end and coupled to the inner surface of first side member (26, 126, 226, 326, 426) and a second reinforcement member (60, 360) having a first end and a second end coupled to the inner surface of the second side member (28, 128, 228, 328, 428), wherein the first end of the first reinforcement member (58, 358) supports the first end of the additional load transfer member (333) and the first end of the second reinforcement member (60, 360) supports the second end of the additional load transfer member (333).
4. The seat back frame (24, 124, 224, 324, 424) of Claim 1, wherein at least one of the upper cross member (32, 132, 232, 332, 432), the lower cross

member (30, 130, 230, 330, 430), and the load transfer member (74) are tubular.

5. The seat back frame (24, 124, 224, 324) of Claim 4, wherein the upper cross member (32, 132, 232, 332, 432), the lower cross member (30, 130, 230, 330, 430), and the load transfer member (74) have one of a rectangular, circular, oval, and C-shaped cross-section.
6. The seat back frame (24, 124, 224, 324, 424) of Claim 1, wherein the upper cross member (32, 132, 232, 332, 432) and the load transfer member (74) are integral and formed as a single unitary member
7. The seat back frame (24, 124, 224, 324, 424) of Claim 1, wherein the upper cross member (32, 132, 232, 332, 432) and the load transfer member (74) are tubular having a rectangular cross-section
8. The seat back frame (24, 124, 224, 324, 424) of Claim 1, wherein the lower cross member (30, 130, 230, 330, 430) is tubular having a circular cross-section and is a load transfer structure that transfers load from an impact through the seat assembly (12).
9. The seat back frame (24, 124, 224, 324, 424) of Claim 1, further comprising a plurality of load transfer members at least partially extending across the seat back frame (24, 124, 224, 324, 424) in one of a horizontal and diagonal pattern.

Patentansprüche

1. Sitzlehnenrahmen (24, 124, 224, 324, 424) zur Verwendung in einer Fahrzeugsitzanordnung (12), wobei der Sitzlehnenrahmen (24, 124, 224, 324, 424) Folgendes umfasst:
 - ein erstes Seitenelement (26, 126, 226, 326, 426) mit einem ersten Ende (34), einem zweiten Ende (36), einer inneren Oberfläche und einer äußeren Oberfläche, und
 - ein zweites Seitenelement (28, 128, 228, 328, 428) mit einem ersten Ende (38), einem zweiten Ende (40), einer inneren Oberfläche und einer äußeren Oberfläche, wobei das erste Seitenelement (26, 126, 226, 326, 426) und das zweite Seitenelement (28, 128, 228, 328, 428) voneinander beabstandet sind;
 - ein oberes Querelement (32, 132, 232, 332, 432) mit einem ersten Ende (46) und einem zweiten Ende (48), wobei das erste Ende (46) mit dem ersten Ende (34) des ersten Seitenelements (26, 126, 226, 326, 426) gekoppelt ist und das zweite Ende (48) mit dem ersten Ende (38) des zweiten Seitenelements (28, 128, 228, 328,

428) gekoppelt ist;

- ein unteres Querelement (30, 130, 230, 330, 430) mit einem ersten Ende (42) und einem zweiten Ende (44), wobei das erste Ende (42, 342) mit dem zweiten Ende (36) des ersten Seitenelements (26, 126, 226, 326, 426) gekoppelt ist und das zweite Ende (44) mit dem zweiten Ende (40) des zweiten Seitenelements (28, 128, 228, 328, 428) gekoppelt ist; und
- ein mittleres Querelement (33, 133, 233), das diagonal positioniert ist und als ein Lastübertragungselement (74) wirkt,

wobei das Lastübertragungselement (74) ein erstes Ende und ein zweites Ende aufweist, wobei das erste Ende mit einem aus einem mittleren Teil des ersten Seitenelements (26, 126, 226, 426) und einem mittleren Teil des zweiten Seitenelements (28, 128, 228, 428) gekoppelt ist und das zweite Ende mit einem mittleren Teil des unteren Querelements (30, 130, 230, 430) gekoppelt ist, sodass sich das Lastübertragungselement diagonal nach unten in Richtung des unteren Querelements (30, 130, 230, 330, 430) erstreckt, wobei das Lastübertragungselement (74) eine Lastübertragungsstruktur ist, die eine Last von einem Aufprall durch die Sitzanordnung (12) überträgt.

2. Sitzlehnenrahmen (24, 124, 224, 324, 424) nach Anspruch 1, ferner umfassend ein zusätzliches Lastübertragungselement (333) mit einem ersten Ende und einem zweiten Ende, wobei das erste Ende mit dem mittleren Teil des ersten Seitenelements (26, 126, 226, 326, 426) gekoppelt ist und das zweite Ende des zusätzlichen Lastübertragungselements (333) mit dem mittleren Teil des zweiten Seitenelements (28, 128, 228, 328, 428) gekoppelt ist, und wobei das Lastübertragungselement (333) eine Lastübertragungsstruktur ist, die die Last von einem seitlichen Aufprall durch die Sitzanordnung (12) überträgt.
3. Sitzlehnenrahmen (24, 124, 224, 324, 424) nach Anspruch 2, ferner umfassend ein erstes Verstärkungselement (58, 358) mit einem ersten Ende und einem zweiten Ende und gekoppelt mit der inneren Oberfläche des ersten Seitenelements (26, 126, 226, 326, 426) und ein zweites Verstärkungselement (60, 360) mit einem ersten Ende und einem zweiten Ende, gekoppelt mit der inneren Oberfläche des zweiten Seitenelements (28, 128, 228, 328, 428), wobei das erste Ende des ersten Verstärkungselements (58, 358) das erste Ende des zusätzlichen Lastübertragungselements (333) stützt und das erste Ende des zweiten Verstärkungselements (60, 360) das zweite Ende des zusätzlichen Lastübertragungselements (333) stützt.

4. Sitzlehnenrahmen (24, 124, 224, 324, 424) nach Anspruch 1, wobei zumindest eines aus dem oberen Querelement (32, 132, 232, 332, 432), dem unteren Querelement (30, 130, 230, 330, 430) und dem Lastübertragungselement (74) röhrenförmig sind.

5. Sitzlehnenrahmen (24, 124, 224, 324) nach Anspruch 4, wobei das obere Querelement (32, 132, 232, 332, 432), das untere Querelement (30, 130, 230, 330, 430) und das Lastübertragungselement (74) einen aus einem rechteckigen, kreisförmigen, ovalen und C-förmigen Querschnitt aufweisen.

6. Sitzlehnenrahmen (24, 124, 224, 324, 424) nach Anspruch 1, wobei das obere Querelement (32, 132, 232, 332, 432) und das Lastübertragungselement (74) integral und als ein einzelnes einheitliches Element ausgebildet sind.

7. Sitzlehnenrahmen (24, 124, 224, 324, 424) nach Anspruch 1, wobei das obere Querelement (32, 132, 232, 332, 432) und das Lastübertragungselement (74) röhrenförmig mit einem rechteckigen Querschnitt sind.

8. Sitzlehnenrahmen (24, 124, 224, 324, 424) nach Anspruch 1, wobei das untere Querelement (30, 130, 230, 330, 430) röhrenförmig mit einem kreisförmigen Querschnitt ist und eine Lastübertragungsstruktur ist, die die Last von einem Aufprall durch die Sitzanordnung (12) überträgt.

9. Sitzlehnenrahmen (24, 124, 224, 324, 424) nach Anspruch 1, ferner umfassend mehrere Lastübertragungselemente, die sich zumindest teilweise in einem aus einem horizontalen und diagonalen Muster über den Sitzlehnenrahmen (24, 124, 224, 324, 424) erstrecken.

Revendications

1. Cadre de dossier de siège (24, 124, 224, 324, 424) destiné à être utilisé dans un ensemble siège de véhicule (12), le cadre de dossier de siège (24, 124, 224, 324, 424) comprenant :

un premier élément latéral (26, 126, 226, 326, 426) ayant une première extrémité (34), une seconde extrémité (36), une surface intérieure et une surface extérieure, et
un second élément latéral (28, 128, 228, 328, 428) ayant une première extrémité (38), une seconde extrémité (40), une surface intérieure et une surface extérieure, le premier élément latéral (26, 126, 226, 326, 426) et le second élément latéral (28, 128, 228, 328, 428) étant espacés l'un de l'autre ;

- une traverse supérieure (32, 132, 232, 332, 432) ayant une première extrémité (46) et une seconde extrémité (48), la première extrémité (46) étant accouplée à la première extrémité (34) du premier élément latéral (26, 126, 226, 326, 426) et la seconde extrémité (48) étant accouplée à la première extrémité (38) du second élément latéral (28, 128, 228, 328, 428) ;
- une traverse inférieure (30, 130, 230, 330, 430) ayant une première extrémité (42) et une seconde extrémité (44), la première extrémité (42, 342) étant accouplée à la seconde extrémité (36) du premier élément latéral (26, 126, 226, 326, 426) et la seconde extrémité (44) étant accouplée à la seconde extrémité (40) du second élément latéral (28, 128, 228, 328, 428) ; et
- une traverse centrale (33, 133, 233) positionnée en diagonale et servant d'élément de transfert de charge (74),
- l'élément de transfert de charge (74) ayant une première extrémité et une seconde extrémité, la première extrémité étant accouplée à l'une d'une partie centrale du premier élément latéral (26, 126, 226, 426) et d'une partie centrale du second élément latéral (28, 128, 228, 428) et la seconde extrémité étant accouplée à une partie centrale de la traverse inférieure (30, 130, 230, 330, 430) de sorte que l'élément de transfert de charge s'étende en diagonale vers le bas en direction de la traverse inférieure (30, 130, 230, 330, 430), l'élément de transfert de charge (74) étant une structure de transfert de charge qui transfère une charge provenant d'un impact à travers l'ensemble siège (12) .
2. Cadre de dossier de siège (24, 124, 224, 324, 424) selon la revendication 1, comprenant en outre un élément de transfert de charge supplémentaire (333) ayant une première extrémité et une seconde extrémité, la première extrémité étant accouplée à la partie centrale du premier élément latéral (26, 126, 226, 326, 426) et la seconde extrémité de l'élément de transfert de charge supplémentaire (333) étant accouplée à la partie centrale du second élément latéral (28, 128, 228, 328, 428), et l'élément de transfert de charge (333) étant une structure de transfert de charge qui transfère la charge provenant d'un impact latéral à travers l'ensemble siège (12).
 3. Cadre de dossier de siège (24, 124, 224, 324, 424) selon la revendication 2, comprenant en outre un premier élément de renforcement (58, 358) ayant une première extrémité et une seconde extrémité et accouplé à la surface intérieure du premier élément latéral (26, 126, 226, 326, 426) et un second élément de renforcement (60, 360) ayant une première extrémité et une seconde extrémité accouplé à la surface intérieure du second élément latéral (28, 128, 228, 328, 428), la première extrémité du premier élément de renforcement (58, 358) supportant la première extrémité de l'élément de transfert de charge supplémentaire (333) et la première extrémité du second élément de renforcement (60, 360) supportant la seconde extrémité de l'élément de transfert de charge supplémentaire (333).
 4. Cadre de dossier de siège (24, 124, 224, 324, 424) selon la revendication 1, au moins l'un de la traverse supérieure (32, 132, 232, 332, 432), de la traverse inférieure (30, 130, 230, 330, 430) et de l'élément de transfert de charge (74) étant tubulaire.
 5. Cadre de dossier de siège (24, 124, 224, 324, 424) selon la revendication 4, la traverse supérieure (32, 132, 232, 332, 432), la traverse inférieure (30, 130, 230, 330, 430) et l'élément de transfert de charge (74) ayant l'une parmi une section transversale rectangulaire, circulaire, ovale ou en forme de C.
 6. Cadre de dossier de siège (24, 124, 224, 324, 424) selon la revendication 1, la traverse supérieure (32, 132, 232, 332, 432) et l'élément de transfert de charge (74) étant solidaires et formés comme un seul élément unitaire.
 7. Cadre de dossier de siège (24, 124, 224, 324, 424) selon la revendication 1, la traverse supérieure (32, 132, 232, 332, 432) et l'élément de transfert de charge (74) étant tubulaires avec une section transversale rectangulaire.
 8. Cadre de dossier de siège (24, 124, 224, 324, 424) selon la revendication 1, la traverse inférieure (30, 130, 230, 330, 430) étant tubulaire avec une section transversale circulaire et étant une structure de transfert de charge qui transfère la charge provenant d'un impact à travers l'ensemble siège (12).
 9. Cadre de dossier de siège (24, 124, 224, 324, 424) selon la revendication 1, comprenant en outre une pluralité d'éléments de transfert de charge s'étendant au moins partiellement à travers le cadre de dossier de siège (24, 124, 224, 324, 424) dans l'un d'un motif horizontal et diagonal.

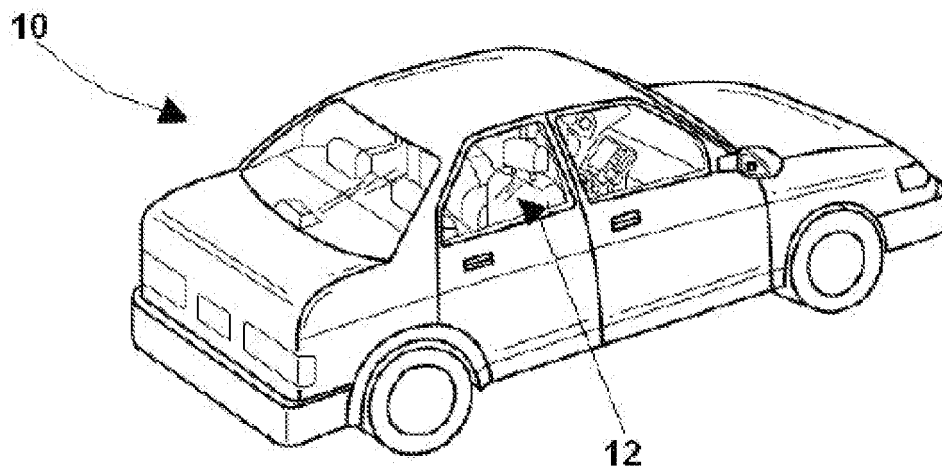


FIG. 1

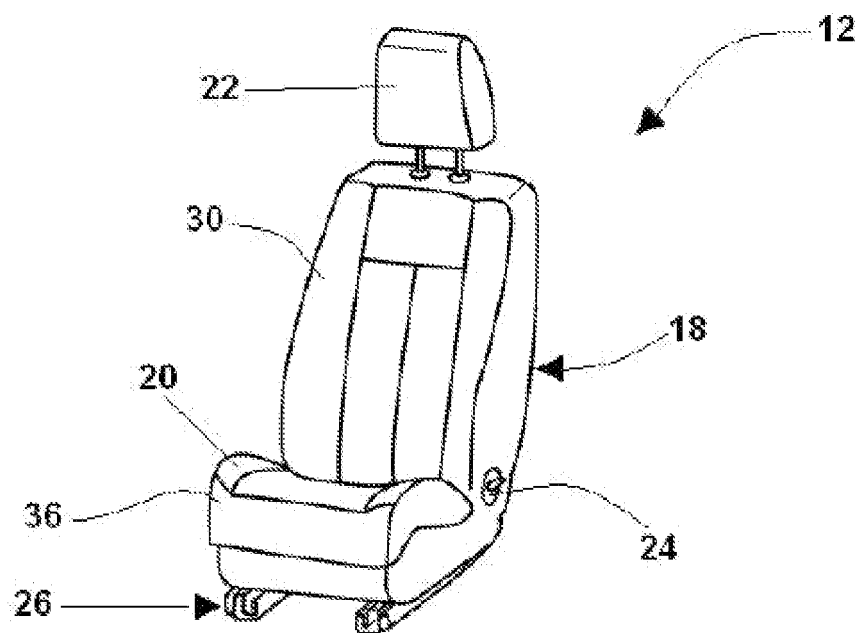


FIG. 2

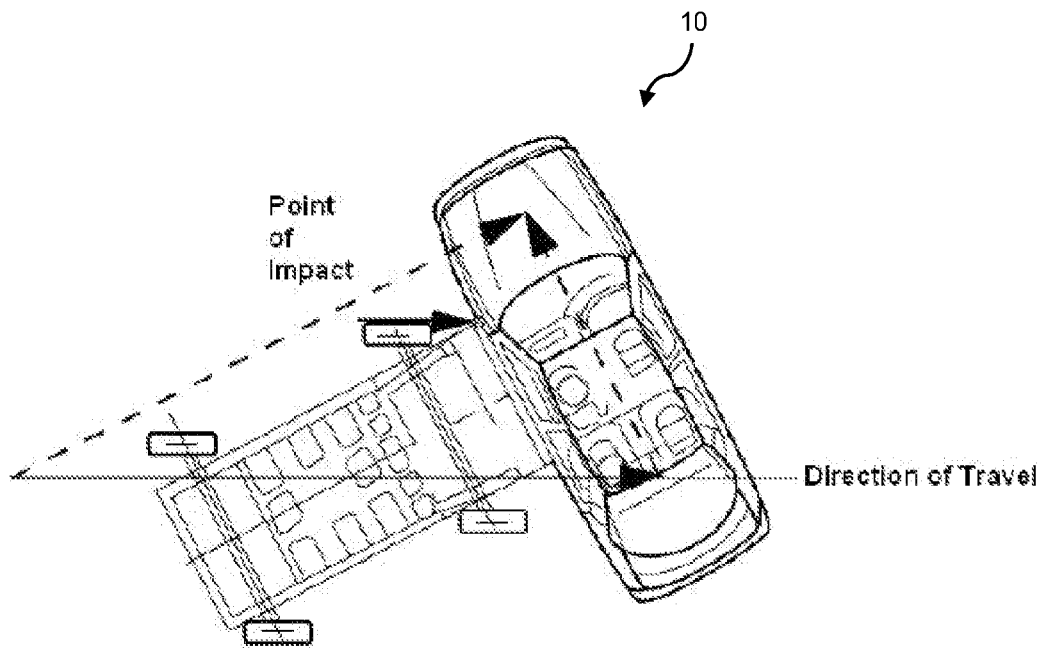


FIG. 3

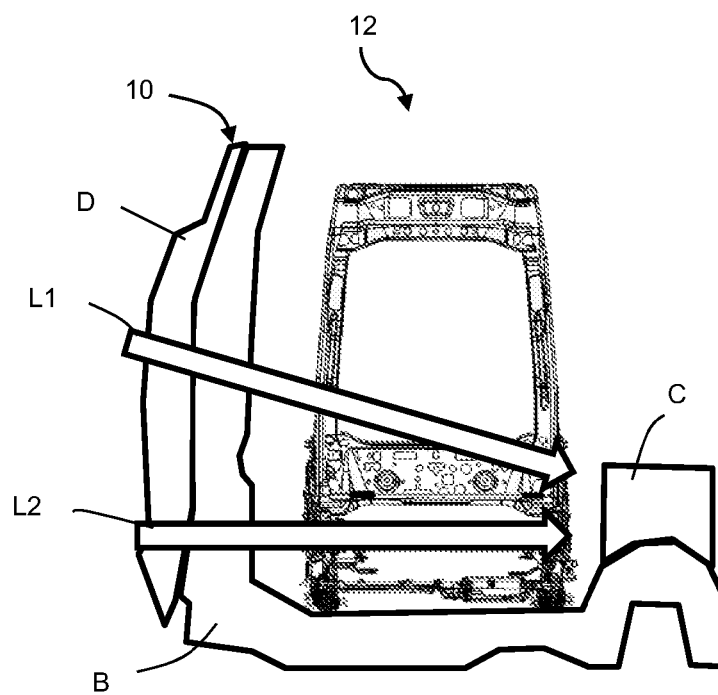


FIG. 4

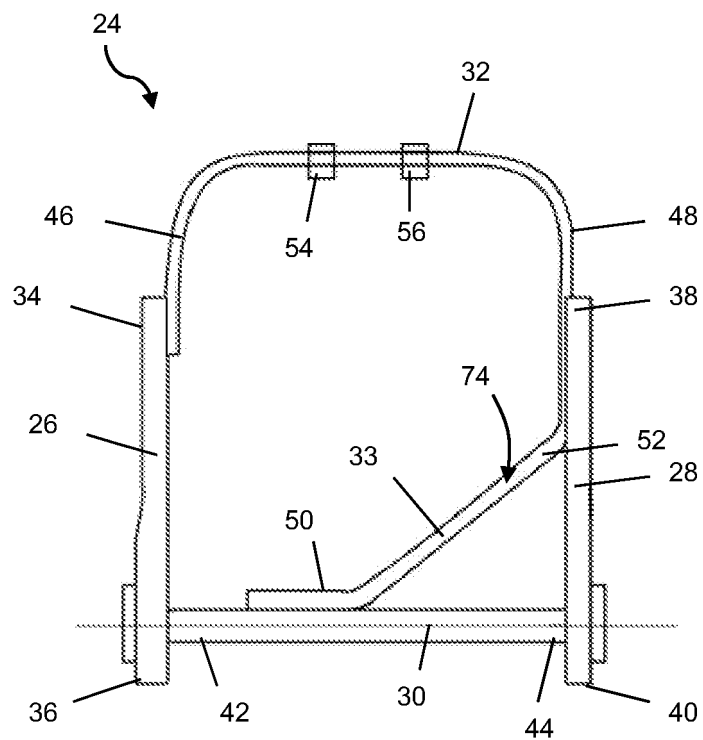


FIG. 5

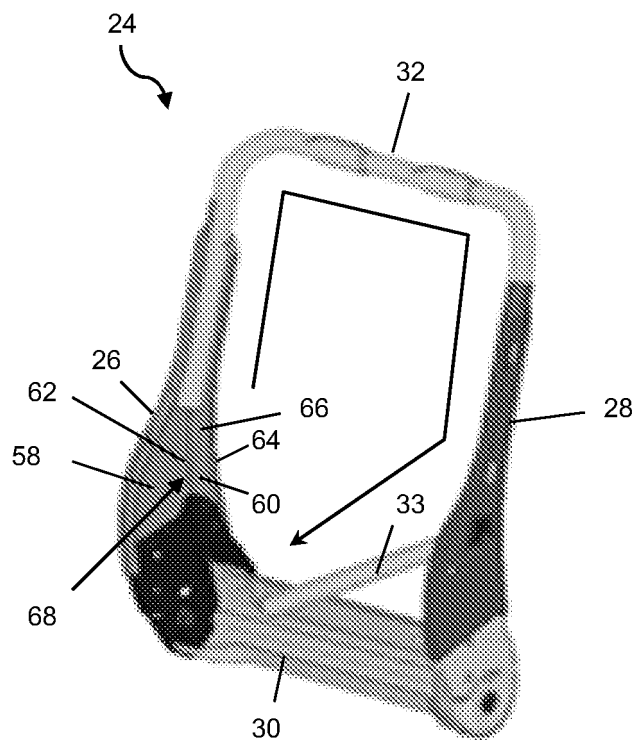


FIG. 6

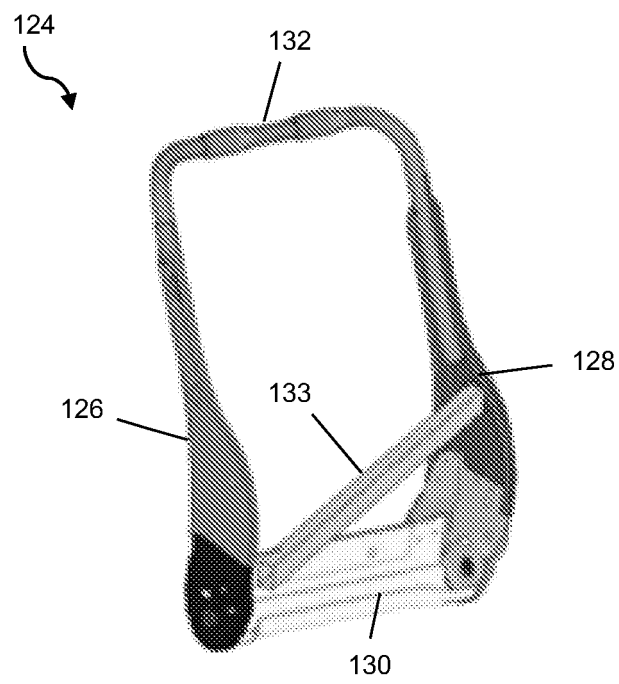


FIG. 7

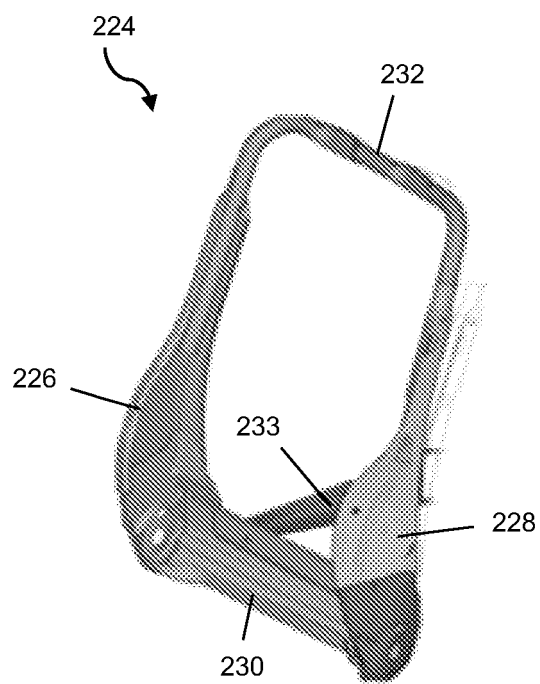


FIG. 8

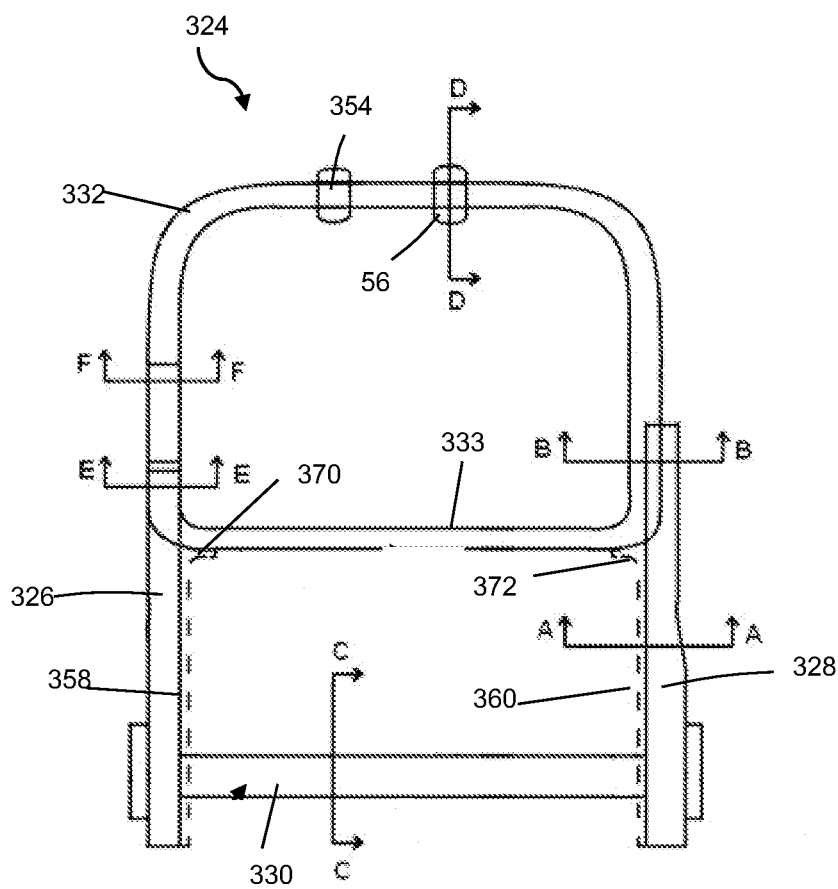


FIG. 9A

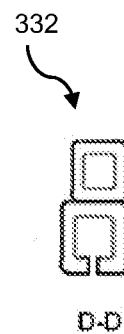


FIG. 9D

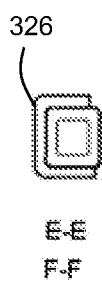


FIG. 9F



FIG. 9E

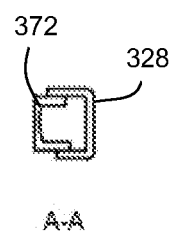


FIG. 9B

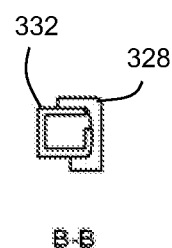


FIG. 9C

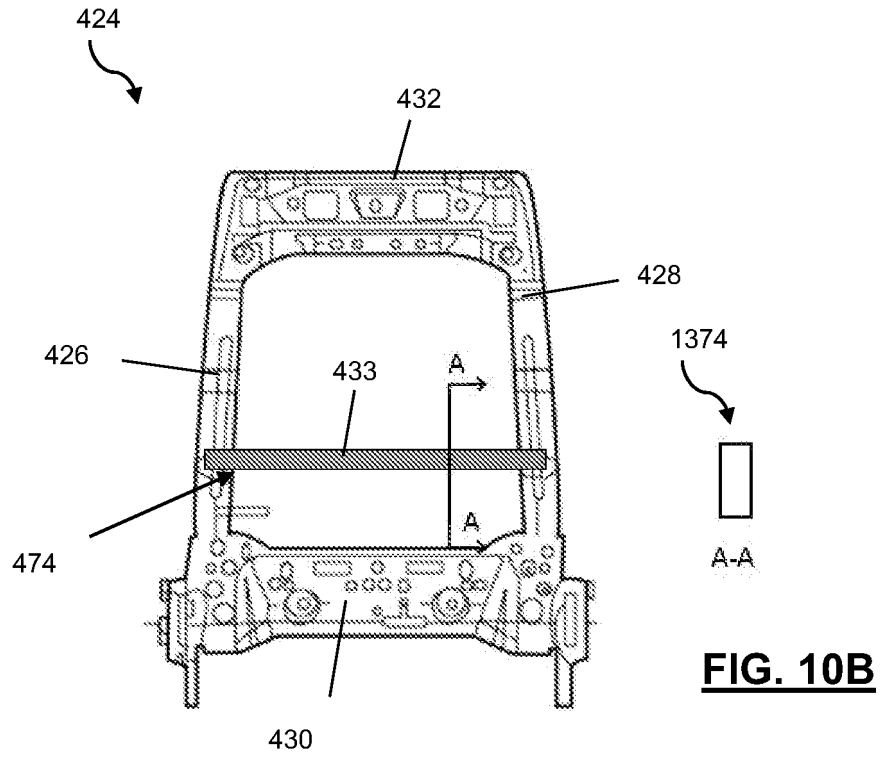


FIG. 10A

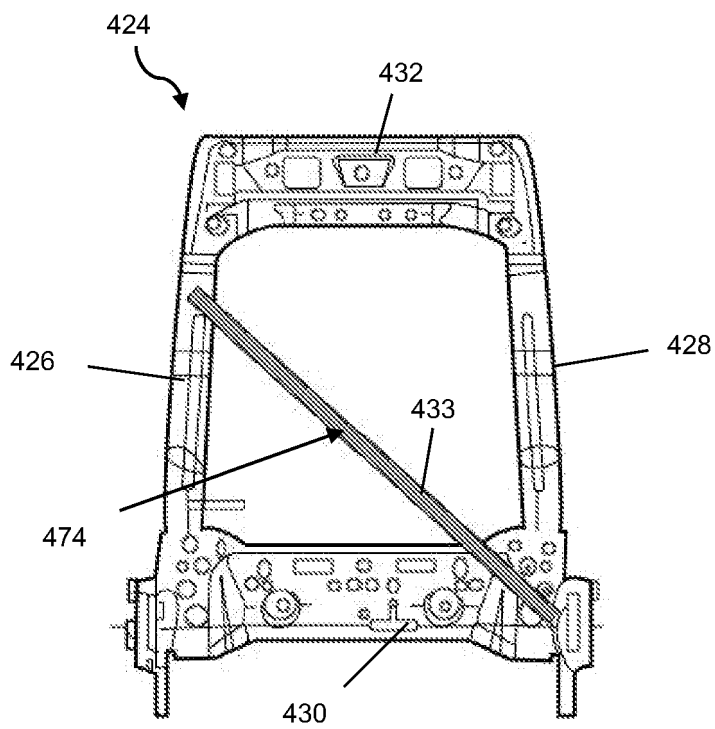


FIG. 11

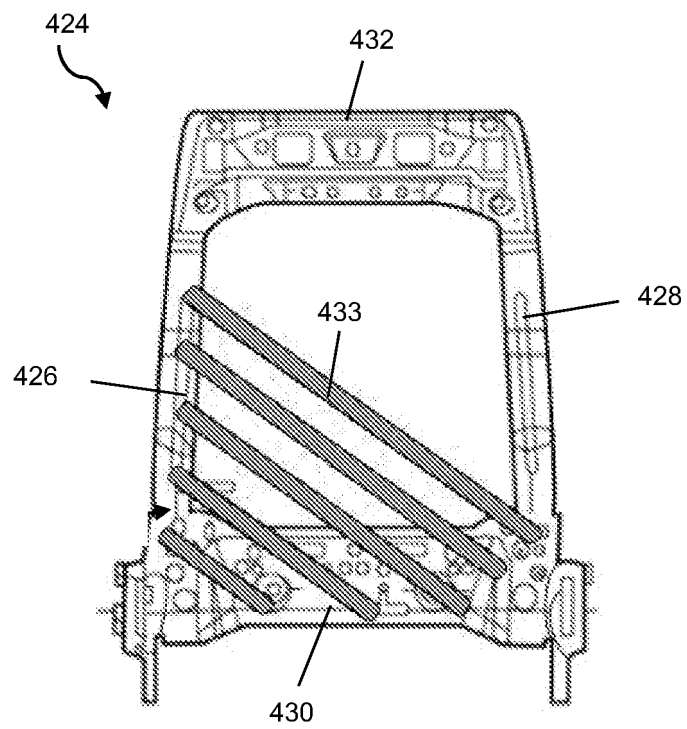


FIG. 12

REFERENCES CITED IN THE DESCRIPTION

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